13 FF k
239

AN ESSAY ON INOCULATION FOR THE SMALL POX.

Wherein the NATURE of the DISEASE is explained,
the various Methods of Preparation that have been
practiced in America are critically examined, and that
which the Author has found, from Experience,
to be moſt ſucceſsful, is clearly laid down.

WITH SOME

EXTRAORDINARY CASES:

AND AN

APPENDIX,

CONTAINING A

Chymical Examination of Mr. SUTTON's Medicines.

By THOMAS RUSTON, M. D.

Ratiocinium plurimum laudo, quod ex effectibus initium ſumit,
et conſequentias ex Phænomenis proſequitur.
HIPPOC. PRÆCEPTA.

THE THIRD EDITION.

LONDON:
Printed for E. and C. DILLY, in the Poultry; and
J. PAYNE, in Paternoſter-Row.
MDCCLXVIII.

MVSEVM
BRITAN
NICVM

THE

PREFACE.

THE favourable reception the two former impreſſions of this book have met with from the public renders it altogether unneceſſary to make any apology for this third; I have therefore given it with very little alteration from the ſecond edition.

The authors of the chief performances upon this ſubject that have been written of late, except one wherein we have an account of the author's own method of practice, have profeſſed no more than to attempt to find out a method, which has hitherto with great care been kept as a ſecret; and ſuch a curioſity was ſufficiently juſtifiable from the amazing ſucceſs that has attended that practice.

But my deſign was very different from theirs. For beſides favouring the world with an account of a practice which had been ſo extenſively uſed with ſo much ſucceſs, and which I was convinced from experience was fully equal to any that had been invented; I was not willing that the credit of the diſcovery ſhould be wreſted from a country, which rude and uncultivated as it is, muſt undoubtedly be allowed to claim the merit of it. I have moreover attempted to do what, I think I may ſay, has never been attempted before with any degree of ſucceſs, to illuſtrate and explain the *nature of the diſeaſe*, which I hope I have performed to tolerable ſatisfaction; and in doing this, I think it is made to appear that the method of practice laid down, is ſo far from being *oppoſite to* *, that it is exactly conformable to the beſt eſtabliſhed theory.

To what greater degree of perfection therefore can we ſo much

---

* See Dr. Dimſdale's Treatiſe on Inoculation, p. 55.

as wiſh the practice of inoculation to be brought than it is, notwithſtanding the illiberal aſpertions thrown out by ſome, whoſe humanity, if it is ſuch as becomes their profeſſion, ought to inſtigate them rather to promote the credit of it.

The propriety of it is confirmed, as well by reaſon as experience; and though ſome unfavourable circumſtances have happened in the hands of *illiterate* perſons; though tumors have aroſe, which when ſuppurated were not eaſy to cure; though repeated eruptions have given riſe to the falſe report of patients having the diſeaſe a ſecond time: Though the *vis vitæ* of ſome, whoſe conſtitutions were not very ſtrong, and the medicines for want of ſkill not duly proportioned, has been injured. Though perſons with weak lungs have been thrown into pulmonic complaints which ended at laſt in phthiſis pulmonalis; yet theſe contingencies are by no means to be charged to the method itſelf, but to a want of ſkill for the moſt part, in the perſons who inoculated; and they certainly are very much miſtaken who imagine that *little* is requiſite, to qualify a perſon to communicate, and conduct a patient through this diſeaſe.

If only fit ſubjects indeed were always to preſent themſelves, there might then perhaps be ſome grounds for this opinion; but while ſuch various conſtitutions, and perſons ſubject to ſuch peculiar idioſyncraſies are daily preſented, certainly no branch of phyſic, requires a more extenſive knowledge of the animal œconomy, of different conſtitutions, of the nature of diſeaſes, and of medicine in general; if we would guard againſt ſuch accidents as have juſt now been mentioned. And I cannot help thinking, it were greatly to be wiſhed that this practice, was reſcued out of the hands of quacks, before many of *theſe* occur, to ſink into ignominy and contempt, one of the greateſt and perhaps the moſt uſeful diſcovery ever made in phyſic.

To many ſuch unacquainted with medical erudition, I am perſuaded a great part of this performance will appear rather too philoſophical; but when reaſoning is introduced from true induction, and a ſtrict attention is paid to ſuch facts as tend either to ſupport or controvert an opinion, *theory* is not only ſafe but neceſſary to conduct the human mind in her future enquiries.

LONDON,
1768.

AN
ESSAY
ON
INOCULATION.

THE method of preparing in inoculating for the ſmall-pox, of which I propoſe to ſpeak in the following treatiſe, was firſt practiſed in America, about the year 1745, which was long before it was made uſe of in any part of Europe; but it is ſomewhat uncertain, who firſt gave the hint of it, though it would be well worth our while to know, to whom we are ſo much indebted for this diſcovery; for gratitude to the author of one, ſo uſeful to mankind, ought to be engraved on our hearts, and his name ſhould be moſt reſpectfully held in perpetual remembrance.

To Dr. Muriſon, in the mean time, of Long Iſland, and Dr. Thomſon of Virginia, we lie principally under obligations, for firſt making the public experience the benefit of it.

I cannot however, help thinking that it is moſt probable, the hint was taken from the learned Boerhaave, who died in 1738; for though he never practiſed it himſelf, nor ſeems to have underſtood the manner in which theſe medicines operate to produce their ſalutary effects; yet, in his chapter of Aphoriſms *de Variolis*, he ſays, that he imagines a ſpecific might be found, amongſt the claſs of *antidotes*, to correct and deſtroy the *variolous virus*; and he adds, that "*In ſtibio & mercurio,*
"*ad magnam penetrabilitatem arte deductis,*
"*nec tamen ſalina acrimonia nimium corro-*
"*ſivis, ſed bene unitis, ut quæramus, in-*
"*citat aliquis horum aliquando ſucceſſus* *."
But, though they might have had this hint from him, yet chance here, as in moſt other uſeful diſcoveries, ſeems principally

---

* Sect. 1392.

to have directed cur Americans; for it would have required more knowledge in chemiſtry than they were maſters of, to compound theſe medicines, by reaſonings deduced *a priore*, ſo as to have their full force; and it was only, the amazing ſucceſs that attended their exhibition, which recommended the method to the public.

The inventors firſt practiſed upon thoſe in their own neighbourhood; but the fame of their ſucceſs extending itſelf, they ſoon had patients, flocking in in crowds upon them from all hands; and the ſame happy event occuring in ſo many, numberleſs inſtances, none, at laſt, would be inoculated but according to this method. Every practitioner, in ſhort, was obliged to acknowledge the ſuperior advantage attending it, and very conſiderable premiums were offered for the ſecret.

But, as uſually happens, where a diſcovery is attended with ſuch conſiderable profits to the poſſeſſor, it was not eaſily to be parted with, many applications were made, but all to no purpoſe, In length of time, however, the number of patients multiplied ſo faſt upon them, and there were ſo many, at a diſtance, deſirous of being inoculated, whom they could not attend, that then, and not till then, could they be prevailed upon to communicate their method.

Neither was it to be purchaſed without a conſiderable ſum. And though large premiums were given, all who purchaſed were laid under obligation not to communicate it to others, unleſs on the ſame conditions on which they received it. Nor did this prevent it from becomming pretty univerſal, for it very ſoon extended itſelf from one end of the continent to the other; and what redounds greatly to the credit of it is, that though it was committed into the hands of perſons very little acquainted with medicine, entirely ignorant of what paſſes in the animal œconomy, and utterly incapable of judging what perſons were proper ſubjects for receiving the ſmall-pox, or what diſeaſes there might be, lurking in the habit, ſo as to render the conſtitution unfit for it; though the operation was performed on perſons of both ſexes, at all ages, and in all conditions of life, and that at a time when there was not above one recovered out of four who had it in the natural way; yet out of the firſt three thouſand, that were taken account of, who received the infection under all theſe diſcouraging circumſtances, there were but five of them died, and theſe were all children of five years of age, who could not be prevailed upon to take the medicines.

But as may be eaſily believed, for reaſons already ſuggeſted, this method was not ſo perfect at firſt, as it was capable of being rendered: various improvements were, by degrees, made upon it; and as there were ſome who did not chuſe to be at the expence of purchaſing, but would rather run the riſque of venturing to imitate the practice, with medicines of their own invention; this too would give riſe to a conſiderable variety. And even though the identical medicines ſhould be luckily fallen upon, which by the bye would be no very difficult matter, as the operation of many of them is pretty manifeſt; yet, it makes a great deal of difference; whether they are exhibited at proper times and in ſufficient quantities, and whether the patient is at the ſame time ordered a proper regimen.

It would be unneceſſary for me, to take notice at preſent, of all the different medicines that were uſed; I ſhall only mention thoſe which approach neareſt to the true method, and which were attended with very great advantage, together with my remarks upon them; and then I ſhall lay down that which from conſtant and repeated experience, I found ſo happily to ſucceed.

Firſt Method.

According to this, from ten to twenty grains of calomel were given over night in a bolus, with an anodyne. The day following, from thirty to forty grains of pulv. cornachin. for a purge; and the day enſuing, the patient was inoculated. After this, the calomel bolus was continued every other night, and the cornachin. the morning following, till four doſes of each had been adminiſtred. On the intermediate evenings, a draught of whey, made by boiling crem. tart. in milk, was taken going to bed; and on the day between the third and fourth bolus of calomel, the ſanguine and plethoric were bled; and this operation was repeated the day before the eruptive fever was expected.

Second Method.

℞. Pulv. antimon. crud. ℥ vii.
Sal. nitr. ℥ iv. miſce.

Deflagra in mortario ferreo, ſeparentur ſcoriæ, et reducatur reliquum in pulverem tenuiſſimam.

℞. Hujus pulv. antimon. gr. vj.
Calomel. ppt. gr. j. *miſce fiat pulvis.*

This was to be given to an adult every night at bed-time, for eight nights ſucceſſively; during which all ſalt food, ſpirituous liquors, butter, oil, and ſuch-like diet was to be carefully avoided. The perſon was then to be inoculated; and the powders to be repeated every night in the ſame manner, till the eruptive fever came on, unleſs the ſalivary glands were affected *; in which caſe, they were to be diſcontinued; and when the patient was ſeized with the eruptive fever, he was to be treated according to the general antiphlogiſtic method.

Third Method.

℞ Calc. antimon.
Crem. tart.
Sal. polychreſt.
Flor. ſulph. aa. part. æqual.
m. f. pulv. refrig. gr. xxx. vel. xl. pro doſi.

---

* Of this, by the bye, there was very little danger as a ſingle grain of calomel, given in this manner every night only to grown perſons, is ſeldom ſufficient, in ordinary caſes, to anſwer that purpoſe.

℞ Calom. ppt. part. duas
Sulph. aurat. ant. part. unam.
Mucilag. gum. tragacanth.
q. ſ. fiat maſſ. pilular.

℞ Pulv. jallap.
—— ſcammon.
Calc. antimon.
Cream. tart. aa part æqual.
miſce fiat pulv. cathart.

The day before inoculation, give to adults ℈ij. of the purging powder, with gr. v. of calomel; and the night following, ten or twelve grains of the antimonial pill, repeating it three nights ſucceſſively. The morning after the third pill, give the cathartic powder; and repeat the antimonial pill and purge as before. As to the refrigerating powder, a portion of it is to be given every morning, except when the cathartics are preſcribed; and it is to be continued till the eruption.

There are objections to be made to all theſe methods, and, as I apprehend, very material ones, both with reſpect to the propriety of the formulæ, and the quantity and times of exhibiting the medicines.

With regard to the firſt of them. It is a great deal too violent. His fibres, as one obſerves, ſhould be like Behemoths, and his nerves like braſs, who would venture to ſubject himſelf to ſuch a treatment. The authors of this practice ſeem to have been ſufficiently aware, that a bolus from ten to twenty grains of calomel, every other night, was by much too large a quantity, and would ſoon ſalivate the patient ; and therefore they ordered a violent doſe of a draſtic purgative, to carry it off the next morning, before it could be abſorbed into the ſyſtem. This, in my opinion, was doing and undoing with a vengeance. Beſides, antimony, which ought, as will afterward appear, to have a conſiderable ſhare in the preparation, was here entirely omitted.

In the ſecond method there is, firſt of all, a proceſs laid down for making a powder, with ſeven parts of antimony and four of nitre ; whereby a tolerably ſtrong preparation is produced; whoſe doſe, to adults, as an emetic, is, from one to four or five grains.

The quantity of nitre here made uſe of, is not ſufficient to deflagrate all the ſulphur from the antimony; but yet, it ſeparates enough to render the regulus liable to be pretty ſtrongly acted upon, by any acid it may meet with in the ſtomach. The preparation is very analogous to the crocus antimonii of the London College.

The objection I have to make to the preſcription which follows, is, that the authors of it have fallen into an error oppoſite to thoſe who invented the firſt method; for here the quantity of calomel is a great deal too ſmall; while that of the antimony is out of all proportion. One grain of calomel, given only every night, is by no means ſufficient to effect the change which is here required: and it is by no means neceſſary to ſubject the patient to the diſagreeable operation of ſix grains of this antimonial every evening; beſides, the joining theſe two medicines together, eſpecially as colomel is given at no other time, by throwing it off as ſoon as it is taken into the ſtomach, diſappoints the very deſign of giving mercury.

The third method comes much nearer the true one, both with reſpect to the medicines themſelves, and the quantity in which they are given. There are, however, ſome chymical abſurdities, of which I ſhall in the firſt place take notice.

The firſt preſcription, we ſee, conſiſts of calx antimon. ſal. polychreſt. crem. tart. and flor. ſulph. And as there has been a good deal of ſtreſs laid, by inoculators, on the calx antimon. it being an antimonial preparation, it may not be amiſs to examine a little particularly into the merits of that medicine.

Calx of antimony is made by deflagrating crude antimony with three parts of nitre. Now, with regard to the different preparations of antimony, let it be remembered, that their different degrees of activity in general, depend upon the ſulphur's phur's adhering more or leſs to the reguline part. Thus, different ſorts of crude antimony, as they contain different proportions of ſulphur in their compoſition, differ, on this account, in the degree of their activity.

If the ſulphur of antimony is ſeparated, by deflagration with nitre, the greater the quantity of nitre made uſe of, *to a certain point*, the more of the ſulphur is conſumed, and the more does the metal, thus diveſted of its corrector, exert its virulence. Thus, antimony, deflagrated with one ſixth of its weight of nitre, in doſes of eight or ten grains, vomits and purges, for the moſt part, very mildly: with half its weight, it vomits ſtrongly, in the quantity of from one to five or ſix grains; and with equal its own weight, it proves, in the ſame doſe, a moſt violent emètic.

This ſeems to be the proportion which pretty exactly ſeparates all the ſulphur from the metal: and, conſequently, produces a medicine of the greateſt virulence.

But if after this, you increaſe the quantity of nitre, part of the antimony will be converted into a calx, and the medicine will by that means become milder: hence, if twice the weight of nitre be made uſe of, the metal will be ſo far calcined, as to appear white; and the medicine will become ſo mild, as to occaſion only ſome ſlight nauſea and gentle vomiting: and if thrice its weight of nitre be deflagrated with the antimony, as in the preſent caſe, which we have now under conſideration, it becomes ſo much a mere calx, that, by being ſubjected to the operation of waſhing, it is entirely indolent.

In this proceſs, however, a part of the nitre is changed into a neutral ſalt, by the vitriolic acid contained in the ſulphur, which unites with the fixed alkali; while the nitrous acid and the phlogiſton fly off in the inflammation; and this produces a nitrum vitriolatum, which is a medicine of no great activity, even if ſuffered to adhere to the calx; but, by ſubjecting this to the operation of waſhing, that alſo is ſeparated from it.

The ſal. polychreſt. is no ways different from the nitrum vitriolatum juſt now mentioned, and therefore very little is to be expected from it; eſpecially if we conſider that it is formed of a volatile vitriolic acid, eaſily detached by means of a vegetable acid, which it is very liable to meet with in the ſtomach *. But even if it ſhould there meet with no ſuch acid, ſo great is the want of chymical knowledge in thoſe who invented this formula, that in the very next article they have added cream of tartar, which they ſeem to have only conſidered as a gentle aperient and refrigerant, not knowing that, when added to this other medicine, it is ſure to effect a decompoſition.

As for the flos ſulphuris, it is at any rate in itſelf but an inert medicine; but this certain and remarkable effect it has of deſtroying the force of metallic preparations, eſpecially that of mercury; in ſo much, that, if thereby a ſalivation is excited, flowers of ſulphur will immediately lower it,

---

* Dictionaire de Chemie, Vol. II.

it. And whatever its effects may be when taken into the body, upon the different preparations of antimony, its uſe muſt be highly improper in a courſe of medicines, the ſucceſs of which ſo much depends on the effects of mercury.

What farther is to be obſerved with regard to the other formulæ made uſe of in this method, will be taken notice of in another place; I ſhall only obſerve here, that conſiderable amendments may be made in the purging powder. The calx antimon. is intirely an uſeleſs addition, tending only to render the powder more bulky, which without it is quite enough ſo; and the powder of jallap is ſufficiently draſtic, without the addition of ſcammony.

But before I proceed to mention the times and quantities in which the medicines ought to be given, and to explain the manner in which they operate, which I ſhall do when I lay down my own method, it will be neceſſary to take a view, and explain the nature of the diſeaſe itſelf, as it occurs without inoculation. This will lead us to lay down indications of cure, and then the propriety of the method employed will appear manifeſt.

I ſhall begin with obſerving, in the firſt place, that the ſmall pox is a diſeaſe entirely unknown to the antients; for neither HIPPOCRATES nor CELSUS make any mention of it, and it is not to be ſuppoſed that ſo accurate an obſerver as the former, who has ſo attentively marked other diſeaſes, ſhould paſs by this ſo remarkable a one unnoticed.

RHAZES, informs us, that AARON, an Alexandrian phyſician, who practiced about the year 622, was the firſt who gave a deſcription of it; whence it has been conjectured, that, poſſibly, the ſmall pox took its riſe in Egypt. But it is not certain whether it firſt appeared in Africa or in Arabia. It is, however, undoubtedly, a diſeaſe of hot countries; and was firſt brought by the Arabs into Spain, at the time of Mohammed's conqueſt; and thence, by means of war and commerce, diſperſed itſelf all over Europe*.

With regard to the manner in which the diſeaſe was originally produced, we are ſtill left in the greateſt uncertainty; and it is not worth our while to ſpend much time in examining into that matter; for we know, that there is no way of propagating it at preſent but one, and that is by infection. This infection is always received from perſons labouring under the diſeaſe; and may be carried by means of cloaths, goods, or any ſpungy ſubſtances that can afford it a nidus, to a great diſtance; and it is communicated to perſons in health, either by myaſmata which floating in the air, are received into the lungs, abſorbed by the pores of the ſkin, mixed with the ſaliva and carried down into the ſtomach; or by means of variolous matter in the way of inoculation.

---

* Dr. Mead. From Mr. Holwell's account it would ſeem as if this diſeaſe, had been of a much older date in India, than we have hitherto been taugh to imagine; (*ſee his account of the manner of inoculating for the ſmall pox in the* East Indies, p. 17.) and he is of opinion that the Egyptians, as well as the Arabs derived it from thence, in their early commerce with the people of the Eaſt, through the red ſea and gulph of Mocha. Be that as it will, it evidently appears to be a diſeaſe of hot climates.

Whatever way this infection is received, the time which it requires in different patients to produce the fever, and other ſymptoms of the diſeaſe, is very various. There are inſtances of perſons who have been ſeized with it any time from the ſixth, nay, from the third or fourth, to the eighteenth day, and even the twentieth; and this variety has taken place in different perſons, who have all received the infection from the ſame patient.

As it affects different perſons with very different degrees of violence, that we may have a more diſtinct idea of it, the natural ſmall pox, may very properly be divided into three ſpecies.

In the firſt of theſe, there is a violent fever; in which, ſometimes the brain, ſometimes the lungs, and ſometimes the throat, and other parts are greatly affected.

Here

Here, the pulſe is rapid, full, tenſe; the breathing hot, ſhort, and laborious; the heat very ſharp, and the urine high coloured; the thirſt great, the tongue dry and foul; the pain of the head, back, loins and limbs exceeding acute; and though there is a thick denſe blood at the beginning, with an inflammatory buff on the top of it, yet its craſis ſoon becomes diſſolved; black and livid ſpots appear; hemorrhages inſue from the noſe, uterus, and kidneys; and the puſtules turn black, gangrenous, and often bloody ſoon after the eruption.

The ſecond ſpecies is of a much gentler nature; the fever is of the remitting kind, and all the ſymptoms are much leſs violent. It generally ſeizes about the eight or tenth day, and is more moderate in the morning than in the evening. About the fourth day from the attack, eruptions appear here and there in different parts of the body, ſoon after which the fever begins to abate, and then the patient finds himſelf in a little time as well as formerly.

But there is a third ſpecies, where the diſeaſe many times comes on with the uſual ſymptoms of a ſlow nervous fever, and the ſick are often a long time complaining, before they can be certain that they are labouring under it. The fever is low; the ſpirits ſunk; the pulſe weak, quick and fluttering; the countenance pale and fallen; the urine crude and thin; no great heat nor thirſt is complained of; but there is a continued giddineſs and heavineſs of the head, with tremblings; a perpetual nauſea and vomiting; univerſal uneaſineſs, weakneſs, wearineſs, &c. and theſe ſymptoms I have known continue, ſometimes for ſix or ſeven days before the ſmall pox have made their appearance, and then they generally proved to be of a very bad ſort; pale, crude, pitted and ſeſſile; never riſing well or maturating kindly, but continuing flat and flaccid, or running together in large watery bliſters, full of thin undigeſted *ichor*. In the face, from a deadly pale cadaverous hue, they generally turned to a ghaſtly black, and formed there a very adheſive cruſt, if the patient lived long enough.

From a very ſlight review of this diſeaſe, and the circumſtances attending it, I think it pretty evidently appears, that it is to be conſidered, contrary to the generally received opinion, rather of the *putrid* than of the *inflammatory* kind; and I cannot help thinking, that perhaps nothing hath been productive of ſuch fatal effects, in the treatment of the ſmall pox, as the miſtaking that which is evidently a putrid, for an inflammatory diſeaſe. As it is therefore a point of no ſmall conſequence, in examining into the nature of it, to determine this matter, I ſhall endeavour to ſupport my opinion by the following arguments.

In the firſt place, from the hiſtory, we learn, that it is properly a diſeaſe of ſummer, ſince it firſt took its riſe in hot climates; and it has long been known, that heat is as much the parent of putrid, as cold is of inflammatory diſeaſes.

HIPPOCRATES, in enumerating the diſeaſes of ſummer, makes mention of a great many *putrid* ones, which were the produce of that ſeaſon; “ *Æſtate vero accidunt et febres continuæ, et* καῦσοι *et tertianæ plurimæ, et vomitus et diarrhææ et oris exulcerationes, et genitalium putredines, et* “ *puſtulæ quædam miliariæ**. And GALEN, deſcribing the nature of putrefaction, ſays, “ *Putredo eſt totius corporis putreſcentis in corruptam naturam externo calore* “ *mutatio, non enim proprio calore corrumpitur quidquam*†. That the ſmall pox rages with moſt violence in hot weather, while the winter, which is capable of putting a ſtop even to the plague itſelf, always renders it milder, is an obſervation ſo common, that no one will attempt to deny the truth of it. But the direct contrary to this muſt happen, if it was an inflammatory diſeaſe; for cold is the principal, nay almoſt the only ſource of inflammation: and hence, Dr. MEAD, from the great analogy there is betwixt this, and the plague, very properly concludes, that “ it “ is *a plague, ſui generis*, which he ima-“ gines was originally bred in Africa, eſpecially

---

* Sect. 3. aph. 28.

† Method. medend. l. 11. c. 8. Charter. tom. 10. p. 254.

“ pecially in Ethiopia, where the heat is “ moſt exceſſive *.”

Secondly, It is an infectious diſeaſe. Now the infectious diſeaſes we are acquainted with, ſuch as the meaſles, the ſmall pox, and the plague, are, all of them, the product of heat, and therefore of the putrid kind. Hence, ARISTOTLE tells us, that dry ſoutherly winds, which were the hoteſt where he lived, produced peſtilential fevers †. AVENZOAR ſays, that the plague was brought on by a dry atmoſphere. RHAZES informs us, that when the ſummer was exceeding hot and dry, and ſucceeded by a hot autumn, in which rains came on very late; then the meaſles quickly ſeized thoſe who were diſpoſed to them, viz. lean, hot, and bilious perſons ‡.

---

* MEAD's works, p. 310. In the provinces of Bengall, the ſmall pox rages epidemically, every ſeventh year with ſcarce any exception, during the months of March, April and May, which is the hot, windy, dry ſeaſon. And on theſe periodical returns, it univerſally proves of the moſt malignant, confluent kind, from which few either of the natives or Europeans eſcape, that take the diſtemper in the natural way,, (HOLWELL, p. 94.)

† Prob. 1.

‡ Vide Mead's works, p. 362.

Livy tells us of a terrible plague, that was excited at Rome, by too much dryneſs *; ſuch a one as Nicephorus gives us a deſcription of †. Virgil, in his third book of the Æneid, where he is giving an account of his *Heroe*'s journey into Crete, relates, that the plague was occaſioned there by a ſtate of heat and dryneſs, which had corrupted the atmoſphere ‡. And Dioemerbroeck attributes the plague of Nœmaguin to the exceſſive heat and dryneſs of the ſummer §.

The circumſtances which have given riſe to the opinion, that the ſmall pox is an inflammatory diſeaſe, are evidently the high fever, full, hard and tenſe pulſe, delirium, and ſuch like, which generally

---

* Decad. 4. l. 1.

† Lib. 15. c. 10.

‡ —— Subito cum tabida membris
Corrupto cæli tractu, miſerandaque venit
Arboribuſque ſatiſque lues, et lethifer annus.
Linquebant dulcis animas, aut ægra trahebant
Corpora, tum ſterilis exurere Sirius agros.
Ardebant herbæ, et victum ſeges ægra negabat.
Æneid. l. 3. ver. 147.

§ De Peſte, l. 1. c. 3.

happen in the firſt ſpecies of this diſeaſe. Theſe, it is true, are ſymptoms common to inflammation; but then they are no more than what we meet with in the very worſt ſpecies of the *putrid* fever; and they proceed from the infectious myaſmata, which act as a ſtimulus on the animated fibres; for let it be remembered, that all infection is to be conſidered as acrimony.

All the difference, therefore, that we have an opportunity of obſerving in the ſeveral ſpecies of ſmall pox, is owing either to the degree of this acrimony, or to the different ſtate of the conſtitution to be acted upon. Hence, if the patient is ſtrong and robuſt, if his fibres are tenſe and rigid, when the ſtimulus is applied to them, they will contract with greater violence, the ſolids will act with more force upon the contained fluids, a greater attrition, and conſequently heat will be excited; and all the febrile and inflammatory ſymptoms will be produced, which are to be met with in the firſt ſpecies of this diſeaſe. But if, on the other hand, the fibres are lax, the conſtitution delicate, and the *vis vitæ* low, the circulation will be languid, little heat or inflammation will be excited, and all things will turn out as in the third ſpecies.

But this infection is not to be conſidered merely as an inflammatory ſtimulus; for a mere inflammatory ſtimulus will never be able to produce a putrid diſſolved blood, pætechiæ, ichorous diſcharges, bloody urine, hemorrhages and ſuch like ſigns of putrefaction, as we have mentioned in the firſt and third ſpecies. Nor would the ſame treatment which is found ſo extreamly ſerviceable in this diſeaſe, be at all proper if it were of the inflammatory kind. Mercury which is ſo freely exhibited in the ſmall pox, is very little if at all uſed in inflammatory diſeaſes. And bleeding ſo eſſentially neceſſary in theſe, is ſeldom if ever to be made uſe of in preparing for the ſmall pox. Expoſure to cold, as well as repeated draughts of cold water, nay drenching the patients with it (a practice ſo often followed with ſucceſs,) are ſo far from being ſervicable, that they are the moſt effectual means for producing inflammation. Beſides, therefore, that this infection has the peculiar property of always producing ſmall pox, it is likewiſe to be conſidered as a putrid ferment, on account of the ſigns of putrefaction which ſo ſoon ſupervene *: and putrid bodies, as appears from Sir John Pringle's experiments, are the moſt ſeptic ferments of any ſubſtances we are acquainted with.

But there is a conſiderable difference to be met with in variolous infection. Though it is all of it more or leſs of a ſeptic nature, yet one infection, is much more ſo than an other.

When the ſmall pox gets into a family, it is often obſerved, though not a conſtant and invariable rule, that the ſeveral individuals have it with pretty nearly the ſame

---

* The Count de Lauraguais, I remember, when ſpeaking, about two years ago, of ſome experiments he had made upon the blood of perſons ill of different diſeaſes in the hoſpitals at Paris, obſerved, that he found that which was drawn from patients labouring under the ſmall pox, putrified much ſooner than blood drawn from any other patients.

violence; and hence we often hear people ſpeak of the particular ſort of ſmall-pox which is come in amongſt them. And there is a very manifeſt difference to be obſerved in the diſeaſe, according as it happens at different ſeaſons of the year. Infection, likewiſe from puſtules which are only beginning to fill, is found to produce milder ſmall pox, than if it is taken when they are come to full maturity; and all this variety ſeems to be, in a great meaſure, owing, to the different degrees of acrimony in the infection.

But the different ſorts of ſmall pox do not wholly, and perhaps not ſo much depend, upon any difference in the nature of the infection, as on the particular ſtate of the conſtitution of the patient; which appears from this, that the very ſame infection will frequently produce very different ſmall pox, in different patients. I have known the beſt infection produce the worſt of ſmall pox, in thoſe who have catched it the natural way; and I have known the moſt putrid ſmall-pox, which have killed the patient, produce the very mildeſt ſort in another perſon, who has catched the diſeaſe at his funeral.

But whether this doctrine, which aſſerts, that the variolous infection is of a ſeptic nature, be admitted or not, it muſt, at any rate, be allowed, that it is an *aſſimilating ferment*. For though the time which it requires to produce the diſeaſe, after it has been taken into the ſyſtem, is very undeterminate, yet it is never capable of exciting a fever, and the other ſymptoms of it as ſoon as it is received; nor does this happen till it has acquired additional force, by converting the juices into its own nature. Neither is it of any conſequence, whether, with the bramins of Indoſtan, we conſider this ferment as conſiſting of animalcules, generated by heat and floating in the air*, or merely as ſeptic particles; for if the effect produced be the ſame, it is not worth our while to puzzle ourſelves, and ſpend time in diſputing about that which is a mere matter of opinion, tending to no uſeful conſequences, eſpecially ſince we ſhall never be able to arrive at any degree of certainty about it. If therefore, only this point ſhould be allowed, (viz. that it is an aſſimilating ferment,) which I think muſt be granted, it is ſufficient to anſwer our preſent purpoſe; and our reaſoning, will equally apply in either caſe, for explaining the nature of the ſmall pox, for whatever has the power of promoting fermentation, has likewiſe a tendency to produce putrefaction; and that for this reaſon, becauſe every degree of advancement which is made in fermentation, is a ſtep towards that period.

---

* Vid. HOLWELL, p. 25.

We know very well, that all the animal ſubſtances we are acquainted with, except a few inſects which have not moiſture enough, ſpontaneouſly run into putrefaction. But all animals conſiſt of their aliments, and theſe are chiefly vegetables, which are of an aceſcent nature. Theſe two circumſtances were ſeemingly contrarieties, which occaſioned a great deal of difficulty amongſt phyſicians formerly, becauſe they could not tell how this change from aceſcency to a ſtate of putrefaction was brought about, for they imagined that it was effected by ſome means or other, very different from fermentation. But here they were evidently miſtaken; for putrefaction and fermentation, whether this is of the vinous or acetous kind, are all of them only different ſtages of the ſame proceſs, as appears from this, that they, always follow in order, one after another, in the ſame ſubject; that this, if a body, which has gone through the vinous and acetous fermentation, is placed in a proper degree of heat, which heat, muſt vary accordingly to the particular nature of the ſubject, it will immediately run into a ſtate of putrefaction. This fact is abundantly confirmed by experiments, and therefore it is not neceſſary for me at preſent, to advance any arguments in proof of it.

But the ingenious Dr. Macbride, of Dublin, has likewiſe proved, beyond controverſy, that the concoction of our aliment, is no other than a true fermentation *.

---

* Vide Eſſay 2. tab. 1, 2.

And how can it be otherwiſe? for if all mixtures, conſiſting of animal and vegetable ſubſtances, when furniſhed with the requiſite quantity of water, and kept in a proper degree of heat, naturally and ſpontaneouſly run into fermentation, without the aſſiſtance of any exciting ferment; how is it poſſible but that the ſame kind of mixtures muſt ferment in the body, eſpecially when at their very firſt entrance into the mouth, and afterwards, as they deſcend through the fauces and œſophagus into the ſtomach, they meet, and are mixed with humours which would immediately bring on fermentation, even if their own nature was averſe to it*?

If, therefore, the natural tendency of our aliments, from the time they are taken in, till they are converted into nouriſhment, and again excreted out of the body, is from an aceſcent ſtate, to a ſtate of putrefaction;

---

* Boerhaave and Hoffman's opinion, that the ſaliva and gaſtric juice, greatly promote the fermentation of vegetables, is abundantly ſupported and proved by Dr. Macbride's experiments, vide eſſays, tab. 2. numb. 2, 4, 6. Vide etiam Pring, append. exper. 29, 30. &c.

trefaction; how much more readily will this change be brought about in the ſyſtem, when promoted by ſo powerful a ferment as the variolous infection? and conſequently how much ſooner will they become putrid? But this opinion will be farther confirmed, by examining into the *cauſes* which tend to *aggravate* the ſmall pox, for they will, all of them, be found to be ſuch as either promote, or do not retard animal putrefaction.

The OCCASIONAL CAUSES are, ANIMAL FOOD, IMPURE and CORRUPTED DIET, a PLETHORA, STRONG and ROBUST HABIT OF BODY, HIGH SEASONED FOOD, SPIRITUOUS LIQUORS, ALKALINE SALTS, OLD AGE, ANXIETY OR FEAR, HEAT, a CONFINED ATMOSPHERE, and OBSTRUCTED PERSPIRATION.

Animal food deſerves to be mentioned among the firſt of theſe; and the reaſon is very plain and obvious. For ſince this fermentation, of which we have been ſpeaking, is inceſſantly going on; if there is not, from time to time, a new ſupply of freſh humours, formed from aceſcent aliments, thrown in upon thoſe which are already converted into our own nature, and have gone through the firſt and ſecond ſtages of fermentation; theſe will very ſoon paſs on into the third, which is the putrefactive ſtate, and become putrid: but animal food is not fit to ſupply this aceſcency, becauſe it is already exactly in the ſame ſtate with our own fluids; and much leſs can this be expected, from *impure* or *corrupted diet*.

Even amongſt animal food, there is a conſiderable difference to be made, becauſe one kind is much leſs liable to putrify than an other.

Young animals, and thoſe which are ſmall of their kind, whoſe fibres are lax, have not their juices ſo highly animalized, as large, ſtrong, and robuſt animals, and are therefore leſs prone to putrefaction; for chyle, we know, and even milk, which have not long been acted upon by the ſolids, are ſtill in an aceſcent ſtate; and veal, lamb, chicken, and ſuch like, are but one ſtep farther advanced; nay, veal broth is known often to turn ſour, while beef or fiſh, even if they do ſhow any degree of aceſency, which is much to be doubted, yet they haſten on very faſt through that ſtate, and are diſpoſed very ſoon to putrify *.

Secondly, A *plethora* is always prejudicial, and that on two or three accounts: for when the veſſels are ſo much diſtended with fluids, that they have not power to contract, and therefore not to dilate themſelves, the circulation being, as it were, choaked up, becomes languid; and all the ſecretions and excretions are performed in leſs quantity. The ſeptic ferment, in the mean time, has a larger maſs to act upon, and conſequently a greater quantity of variolous matter will be accumulated. Beſides, it is a matter of great conſequence in nutrition, that the different parts of our diet ſhould bear a juſt proportion to each other, which ought likewiſe, *to vary*, according to the particular circumſtances of the patient: for if a perſon, of a weak conſtitution, drinks too great a quanty of watery liquors, it will occaſion dropſical ſwellings; and dropſical perſons always find their legs ſwell more than uſual after drinking; nay, ſome people, who are not dropſical, but of lax a conſtitution, have often obſerved their legs ſwell a little after drinking freely. So, in the preſent caſe, where there is ſuch an abundance of perfectly animalized, and well aſſimilated juices, the whole of them is ſtrongly diſpoſed to turn putrid, and there is not ſpace enough left, to throw in, a ſufficient quantity, of aceſcent food, to correct their tendency.

---

* Homberg tells us, that he extracted a conſiderable deal of acid from the blood of young animals, but old ones did not yield it in any ſuch quantity.

Strong and *robuſt perſons*, who have been accuſtomed to hard labour, and whoſe fibres, through too much exerciſe are become tenſe and rigid, have always been found, very unfavourable ſubjects, for the reception of the ſmall pox. Yet, I have never ſcrupled to communicate the infection to ſuch, becauſe they afford, an excellent opportunity, for the medicines to operate: but it is always neceſſary to change and alter this diſpoſition of body, during the courſe of the preparation, entirely. For although it is as we have proved; that the alteration our fluids undergo, in their being changed from an aceſcent to a putreſcent ſtate, is brought about by means of fermentation; yet, as no fermentation can produce any thing ſimilar to *animal fluids* out of the body, ſo neither can the aliments be converted into *them*, without the action of living fibres; and therefore the ſtronger the action of the ſolids is upon the fluids, the quicker will this change be brought about; and, conſequently, the ſooner will the humours become putrid. A hare or a ſtag that have been hunted, will not keep near ſo long, as thoſe that have not undergone that ſevere exerciſe; nay, I have known them not fit to be made uſe of, they have become ſo putrid in twenth-four hours after they were killed *.

---

* Is not Dr. Macbride's remark on fermenting alimentary mixtures exactly conformable to this? For he obſerved, that, by frequently agitating the vitals in which they were contained, the fermentation was greatly expeded.

To this head we may refer *high-ſeaſoned food*, *rich ſauces*, *ſpirituous* and *fermented liquors*, and *alkaline ſalts*; for theſe do not act as is generally imagined, by diſſolving and putrefying the humours, immediately; on the contrary, they are of an antiſeptic nature. The firſt effect of ſpirituous liquors is to give life and vigour to the whole body; to raiſe and exhilerate the ſpirits, by giving an agreeable ſenſation to the ſtomach; (for we know, that, as often as the nerves of the ſtomach are diſagreeably affected, we become melancholy and low ſpirited.) But theſe exhilerating effects are not of any long continuance; they ſoon ceaſe; and in a few hours afterwards, when the whole of the liquor has got into the blood, we feel an unuſual heat, thirſt, quick pulſe, and, in reality, for a time, we labour under a fever; and this fever, occaſioned by the ſtimulus applied to the living ſolids, exciting them into more frequent contractions, produces, pretty nearly, the ſame effects as violent exerciſe: and it is, by deſtroying the acid in the primæ viæ, which is the chief corrector of the putreſcency of the humours, as well as by acting as a ſtimulus, that alkaline ſalts become prejudicial in this diſeaſe.

Aged perſons, or thoſe who are pretty far advanced in life, are generally eſteemed unfavourable ſubjects for inoculation; and it muſt be acknowledged, that they are not ſo ſafe as infants, or thoſe in the younger part of life. Many, however, have been inoculated at the age of ſeventy and upwards, yet they had the diſeaſe very mildly. But they are leſs fit for receiving the ſmall pox, becauſe their fibres are rigid, their ſecretions and excretions leſs; they perſpire leſs than young perſons: and their fluids have a much greater tendency to putrefaction, as appears from the fœtor that attends them; and, probably, this is owing to the longer retention of their fluids, and to the coſtive habit of ſuch perſons, which gives occaſion for a greater quantity of the putrid particles to be again abſorbed, from the fœces, into the ſyſtem *: and *anxiety, fear, and appre-*

---

* Haller. Primæ Lin. Phyſiolog. ſec. 967.

henſion of danger from the diſeaſe, on account of their ſuppreſſing perſpiration, are juſtly eſteemed ominous; for theſe, univerſally, leſſen the ſecretions and excretions, as abundantly appears from Sanctorius's obſervations.

I come now to ſpeak of a cauſe which increaſes putrefaction, as has univerſally been allowed, and which is now pretty generally believed to be very prejudicial in the ſmall pox: I mean *heat*. But though the fact be true, to tell how heat acts upon the body, ſo as to produce this effect is not ſo eaſy a matter. This much, however, is certain, that for conducting fermentation, a certain degree of it is abſolutely neceſſary; and the greater the heat is in our atmoſphere, the more will that operation be expeded: cold immediately puts a ſtop to it.

But there are two kinds of heat to be here taken notice of; firſt, that which proceeds from a perſon's being expoſed to the direct rays of the ſun, and ſecondly, that which is occaſioned by wearing a great quantity of cloths, by being confined to bed, or being ſtived up in a chamber; both of which have the ſame general effects; but their manner of operating to produce theſe effects is different.

With regard to the firſt of theſe; heat occaſioned by the direct rays of the ſun, produces putrefaction pretty much in the ſame manner as ſtrong fibres and too much exerciſe: for, let it be remembered, that heat, in the firſt place, univerſally renders the ſyſtem more irritable, and conſequently, more liable to be acted upon by any ſtimulus, that may be applied; while cold acts as a ſedative.

Secondly, heat rarifies the blood; and by that means, makes it occupy a greater ſpace than it did formerly. It is alſo a well-known law in hydraulics, that if the quantity of any fluid is increaſed, while the ſpace through which it is to paſs continues the ſame, its motion muſt likewiſe be increaſed, that it may be able to perform its circuit in a given time. In the preſent caſe, therefore, the motion of the blood, from the increaſed irritability and conſequently action of the ſolids, as well as from the enlarged bulk of it, being increaſed, all the ſecretions of the body will in the ſame proportion be increaſed likewiſe; for, in the animal machine, the more fluids are brought about to the ſecrening organs in a given time, the greater quantity, *cæteris paribus*, will be ſecreted. Hence the thinner, more volatile, and, if you will, ſpirituous, and watery parts of the blood will be exhaled from the external and internal pores of the body, which are expoſed to the air; and that which remains, for want of the more ſubtile parts, will, as it were, be in a manner inſpiſſated. The ſolids at length, will become dry and rigid; and the oily and ſaline parts of the blood, by their increaſed action will be violently agitated; and by the continual attrition which takes place between the ſolids and fluids, the latter will be ſharpened and rendered more acrimonious.

But the other kinds of heat of which we have made mention, while they promote fermentation, ſeem to act, chiefly, by confining the putrid or infectious particles which are conſtantly ſecreted through the different outlets, and by preventing them from flying off; hence we are kept bathing, as it were, in an atmoſphere of our own bodies, and the infectious particles are again abſorbed, ſo as to act as an additional ferment in the ſyſtem. Hence SYDENHAM affirms, "*nullâ magis* προφασει "*promovetur immodica materiæ varioloſæ* "*aſſimilatio, quam ſi æger intempeſtive ſe* "*lecto addicat, viz. ante diem ſextum a* "*prima invaſione, vel quartum incluſive, ab* "*eruptione* *." And CELSUS's advice will apply fully as well here, as in any other fevers, "*Ut amplo conclavi teneatur æger* "*quo multum et purum aerem trahere poſſit,* "*neque multis veſtimentis ſtrangulandus, ſed* "*admodum levibus tantum velandus* †;" for if a man in health contaminates a gallon of air in the ſpace of a minute, ſo as to render it unfit for reſpiration, how much more impure will it be rendered by a perſon in this diſeaſe, where infectious myaſmata are continually flying off from the ſurface of the body. Laſtly,

---

* Diſſert. Epiſt. G. Cole, M. D.

† L. III. C. 7. P. 143.

If the abſorption of theſe particles is hurtful; that *obſtructed perſpiration*, by which they are retained in the body, muſt likewiſe be prejudicial, is very evident.

Hence it is that the ſmall pox are obſerved to prove ſo generally fatal, to the ſavage Indians of North America, for theſe people live in the hardieſt manner: they are expoſed to the weather in the ſevereſt ſeaſons, almoſt without either cloths or ſhelter. They often have the ſky only for their canopy, the cold earth, or at moſt a bear ſkin ſpread upon it, for their bed, the root of a tree for their pillow, and if it ſnows at night, very frequently a counterpane of ſnow for their covering: we may therefore believe that they perſpir every little, and that their fibres being very tenſe and rigid diſpoſe them very ſtrongly to inflammatory diſeaſes *: but the African ſlaves on the other hand, whoſe pores are open, whoſe fibres are lax, and who perſpire more perhaps than almoſt any other perſons, have the diſeaſe for the moſt part very mildly.

---

* As a proof that the cold regimen is not the only thing of uſe in this diſeaſe, it is a conſtant practice with theſe people, to plunge themſelves into a river, or ſome lake of cold water, as ſoon as they are ſeized with the fever, notwithſtanding which the diſeaſe generally proves fatal.

Thus much with reſpect to the *occaſional cauſes*, or circumſtances which tend to aggravate the ſmall pox: but it has been matter of great diſpute, at what age it is moſt proper, for perſons to undergo this diſeaſe by inoculation. I have given my reaſons why I think an advanced one, is not to be prefered, though even that is not abſolutely to be objected to: but no objection can be made againſt thoſe, from two years old to the age of puberty, who are not affected with any particular diſorder. Indeed children of almoſt any age may be very ſafely inoculated if we only take care that they are not labouring under any indiſpoſition of body, ſuch as worms, teething, aphthæ, watry gripes and the like, when the infection is communicated, and to which they are very liable.

One of the firſt perſons I ever inoculated, was a little girl, a near relation of my own, aged five months, and it could ſcarcely be wiſhed, that any one ſhould have the diſeaſe more mildly. The only circumſtance, from which we have reaſon to apprehend much danger, is the fits to which young and tender infants are often ſubject, at the coming on of the eruptive fever; theſe are frequently known to carry off the patients, before the ſmall pox make their appearance, when they have the diſeaſe in the natural way; but from obſervation it appears that this ſymptom, if they have the good fortune to ſurvive it, may generally be depended on, as a pretty certain pledge, that they will have the diſeaſe very favourably.

And now that I am on the ſubject of prognoſtication, I would beg leave to take notice of an appearance, which when it occurs, is very apt to alarm the patient; I mean a *raſh*, which frequently happens, during the firſt attack of the fever. The whole ſurface of the body is ſometimes covered with it, and ſo thick are they, that if all the eruptions were to turn out ſmall pox, it would be impoſſible for the patient to live under them. But inſtead of our having occaſion to be alarmed, this too is moſt frequently to be conſidered as a favourable ſymptom. The great difficulty ſeems to lye in our not being able to diſtinguiſh eaſily between this and the confluent ſmall pox, which it ſo much reſembles; but by attending to the following circumſtances, this difficulty, I apprehend, may be in a great meaſure removed.

In the confluent ſmall pox, the ſymptoms are much more violent, then they are in this raſh; the fever, reſtleſſneſs, pain of the head back and loins is much greater, there is a greater proſtration of ſtrength, and patients under inoculation, are much more liable to it than thoſe who have the ſmall pox in the natural way, but to what is it owing, whether to the great evacuation of variolous matter, by means of the preparatory medicines, through the pores of the ſkin, by which they are as it were fretted, or not, it is not mine to determine. Sometimes on careful examination, a few diſtinct puſtules larger than the reſt, may be diſcerned, mixed with the raſh, which are indeed real ſmall pox, but it generally dies away and peels off in a dry ſcurf by the time the true ſmall pox make their appearance, and it does not ſo frequently happen when the patient is ſubjected to a cool as to a hot regimen.

From what hath been ſaid of the nature and cauſes of the ſmall pox, the indications to be followed in preparing the body to have it by inoculation are, evidently, two:

The firſt is, to oppoſe; and by that means to moderate the influence of the variolous infection, in aſſimilating our juices.

The ſecond to evacuate the variolous matter, as faſt as it is formed, out of the conſtitution.

The firſt of theſe, principally, relates to the diet and regimen of the patient. The ſecond, to the medicines to be employed. And with regard to the firſt of them, from what hath been ſaid under the occaſional cauſes, it evidently appears with how much propriety a cool regimen is ordered.

We have ſeen what are the natural bad effects of heat; and, therefore, we may reaſonably expect the contrary to happen from an oppoſite treatment.

A ſucceſſion of free air not only cools and fans our bodies, but wafts away the atmoſphere of putrid particles which continually exhales from, and ſurrounds them.

There are, however, ſome, I know, who inveigh exceedingly againſt the extreme cold regimen which has been preſcribed, though it is, in general found, ſo very ſerviceable. And, indeed, at firſt ſight it ſeems abſurd to expoſe perſons labouring under a diſeaſe to degrees of inclemency in the atmoſphere, which would certainly prove hurtful to perſons in health.

But it is very certain, that perſons labouring under certain diſeaſes are better able to bear thoſe extremes which are oppoſite to their natures, than even if they were in health. A perſon in a high fever may be expoſed to a greater degree of cold without being ſenſible of any inconvenience from it, though ſuch a treatment could not be recommended; and to thoſe who are ill of the natural ſmall pox, nothing can be more agreeable than the admiſſion of freſh air. When they have been almoſt ſuffocated with the diſeaſe, and gaſping for breath, I have known the poor expiring creatures, by throwing open the windows, in the ſevereſt ſeaſons, as it were, re-animated; and ſo rejoiced have they been at the agreeable change, that, on no account, neither night nor day, would they ſuffer them to be ſhut. And the reaſon why it is ſerviceable, is obvious; for, where there is a ſeptic ferment continually aſſimilating and putrifying our fluids, a greater degree of cold can not only be born, but is requiſite to oppoſe it.

This practice is by no means new; for **Rhazes**, who is the firſt author of any note that wrote on the ſmall pox, made uſe of it.

He lived in the country where the diſeaſe took its riſe, and, conſequently, had an opportunity of viewing it in its genuine and natural ſtate; and conſidering it as a truly putrid diſeaſe, ſoon experienced the good effects of ordering an exceeding cool regimen.

He not only ordered the chambers of his patients, who were preparing for the ſmall pox, to be kept cool, by the free admiſſion of air; but he likewiſe directed them to drink water cooled by ſnow, or clear ſpring water, with which their chambers were alſo to be ſprinkled. Nay, he ſays, that the patient may go into cold water, at noon, and ſwim about in it; and when the ſymptoms of the diſeaſe begin to appear, in order the more effectually to extinguiſh the internal heat and putrid tendancy, he adviſes him to "drink "water, made cold in ſnow to the high- "eſt degree, very plentifully and often,

" ſo that he may feel the coldneſs of it in
" his bowels.

" If, after this, the fever and burning
" return, give this water a ſecond time,
" two or three pints, or more, in the
" ſpace of half an hour: and if ſtill the
" heat return, and the belly be full of
" water, make him vomit it up, and then
" give it again. And he adds, that, if
" the water finds a paſſage either by ſweat
" or urine, you may be aſſured the patient
" is in a good way."

The Bramins of Indoſtan ordered four collons (an earthen pot, containing about two gallons) of cold water, to be thrown over the patient, from the head downwards, early on the morning ſucceeding inoculation, and this was to be repeated every morning and evening, until the fever came on, (which commonly happened about the cloſe of the ſixth day after the operation;) then he was to deſiſt till the appearance of the eruption (which was commonly at the cloſe of the third day from the commencement of the fever)

ver:) he was then to purſue the cold bathing as before, through the whole courſe of the diſeaſe, and until the ſcabs of the puſtules dropt off *. And with reſpect to air, confinement to the houſe was abſolutely forbid: the inoculated were ordered to be expoſed to every wind that blowed, and the utmoſt indulgence that they were allowed, when the fever came on was to be laid on a mat at the door.

Dr. SYDENHAM's practice was very ſimilar to this, with reſpect to cold; for, at moſt, he would not ſuffer his patients to keep their beds till the firſt appearance of the eruption; nor would he allow more fire in their rooms, or more cloaths on their beds, than what they were accuſtomed to when in health; but he often enjoined even a much ſtricter regimen †.

---

* Holwell, p. 18.

† For a more particular account of his practice, I refer the reader to his own works, or to Dr. Baker's late very candid and ingenuous pamphlet upon the ſmall pox where he will meet with ſeveral additional arguments in favour of that practice.

But I do not mean to recommend RHAZES's practice, in giving cold water in the manner in which he did, nor to enforce the cool regimen in the full extent of it; for, though there can be no doubt but it is, in general, ſerviceable; yet, like every other good thing, it may be abuſed by carrying it to too great a length. Food which is ſalutary, and abſolutely neceſſary for the ſupport of the body, may, by eating too much of it, occaſion a ſurfeit. I think there is a degree of preſumption in "carrying patients into the fields while ſhivering under the rigor of the fever, in allowing them no liquor but what they have been able to procure for themſelves at the pump, while the fever has been upon them, and in their having been indiſcriminately expoſed to the air in all ſorts of weather, and in all ſeaſons, during every period of the eruption."

As the cool regimen is not the only remedy; ſo, neither is the whole, nor, perhaps, ſo much ſtreſs as ſome are ready to allow, to be laid upon it. Another very material circumſtance to be attended to, is, the diet of the patients.

I need not now explain why fleſh, in general, ought to be abſtained from, nor why the aliments ought to be chiefly vegetable, and of the aceſcent kind.

Milk, though it is an animal production, has not yet been ſo much acted upon by the ſolids, as to loſe its aceſcency, and is, therefore, very proper*.

Oils

---

* Here we differ from the eaſtern practitioners, with whom milk is one of the only three articles in diet that is forbid. There is however ſome degree of plauſibility I confeſs in their method of reaſoning with regard to it. Milk, ſay they, not only from its ready admiſſion into the blood, but likewiſe from its quick aſſimulation with it, is a healing diet, and for this reaſon it muſt have a remote tendency to inflammation, eſpecially whenever the blood is thrown into any preternaturul fermentation, as is the caſe in the ſmall pox.

I ſuppoſe it is upon this principle, that our women here during the courſe of their periodical viſitations, ſtrictly and religiouſly abſtain from the uſe of milk, leaſt it ſhould upon any accidental cold, diſpoſe the uterus to inflammation, certain it is that the uſe of it is ſtrictly forbid in India, and it is avoided as ſo much poiſon during the flow of the lochia; and our European women, reſident

Oils, and oily ſubſtances, are to be avoided, not only becauſe they are the moſt indigeſtible of all aliments, and conſequently apt to occaſion crudities and generate phlegm, but becauſe they invelope and tend to deſtroy the effects of medicines.

In general, the patient may be allowed tea, coffee, or weak chocolate, with dry toaſt; rice-milk, milk-gruel, ſkimmed milk, and ſuch like, for breakfaſt.

For dinner, rice pudding, apple-pudding, apple-pye, plumb or plain pudding, with vinegar ſauce, made by adding ſugar and vinegar to a proper quantity of boiled flour and water. Rice-milk, milk and flummery, and the productions of the kitchen garden, with the uſe of ſalt; for that may be uſed, though ſalt meats are

---

ſident there, will not at thoſe times, on any conſideration, mix the ſmalleſt quantity of it with their tea, having adopted the ſame precaution, after experiencing the bad effects of it; and this leſſon they have learned from their midwives, who are all natives, and generally inſtructed in their calling by the bramins and other practitioners in phyſic. (Holwell) After ſkimming the milk however, none of theſe bad effects are to be apprehended.

objected to, and none of the ſame bad conſequences will follow from it. Moſt kinds of fruit may be eaten at pleaſure, except juſt when the patient is taking medicines.

Supper had better be in general, omitted, if that can be done conveniently; but, at any rate, it ſhould be light, cooling, and of eaſy digeſtion: roaſted potatoes, turnips, and ſuch like; or any of the above ſpoon-meats will be proper; but all fleſh, butter, cheeſe, and ſpiced food muſt be religiouſly avoided.

As all ſpirituous, vinous and malt liquors would be highly pernicious, I would not adviſe any thing more for drink than toaſt and water, milk and water, or lemonade. Nor ought the patient to uſe much exerciſe; ſome, however, is neceſſary, as far as is requiſite for enjoying a change of air, and for keeping up a free perſpiration.

To anſwer the ſecond intention, which is to evacuate the variolous matter as faſt as it is formed out of the conſtitution, nothing

thing can be better calculated than the medicines that are uſed.

Mercury, antimony, and their different preparations, are principally to be depended upon; and their uſe in the ſmall pox, is not in the leaſt repugnant, as ſome have imagined, to our notion that it is a putrid diſeaſe.

With reſpect to the firſt of them, it has been conjectured that it breaks down the globules of blood, deſtroys its *craſis*, and by that means diſpoſes it ſtrongly to putrefaction: but this is an opinion founded on no better evidence, then that when taken in conſiderable quantity, it occaſions a plentiful flow of ſaliva, which is a thin and watery liquor; or at moſt becauſe this diſcharge is often fætid, which is the caſe with almoſt every critical evacuation: and the ſame objections may with full as much propriety be made againſt diuretics, or any other medicines that greatly promote any of the excretions. Nor are there the leaſt grounds to think that it ever produces livid ſpots or mortification; for even though it were a matter of fact, that it broke down the red globules, or rather prevented our juices from being converted into them, and by that means increaſed the proportion of ſerum and coagulable lymph: yet this, I apprehend, is a proceſs very different from animal putrifaction, which, even in the ſmalleſt degree, deſtroys the coheſion of that entirely. But I have on the other hand known the lymph, after the exhibition of mercury, retain its texture ſo much, that blood which had been imprudently drawn from a perſon under a deep ſalivation, had a tough inflammatory buff on the top of it after ſtanding. As for antimony, eſpecially that preparation of it called tartar emetic, it is very well known that there is no better medicine can be made uſe of, not even in the putrid fever *.

It has been imagined that theſe medicines act as antidotes, which deſtroy the very

---

* For the proper method of exhibiting this medicine in thoſe diſeaſes, ſee my diſertation DE FEBRIBUS BILIOSIS PUTRIDIS.

very nature and exiſtence of variolous virus. But there are no inſtances to prove, that any, or both of them, mixed with variolous infection, will deſtroy its efficacy in producing ſmall pox.

In the rude and uncultivated ages of philoſophy, the doctrine of antidotes and ſpecifics was very much in vogue. Men, either from a notion, that it would be preſumptuous in them to attempt to ſearch into the *recondita* of things, or from a lazineſs of diſpoſition, which prevented them from giving themſelves much trouble, were very ready to reſolve effects into ſome unknown or occult qualities. But a genius for more free enquiry has long ſince taken place, we are now diſpoſed to account for effects from natural cauſes; and the doctrine of antidotes and ſpecifics is very much exploded. We now admit of nothing in philoſophy as matter of fact, but what is the reſult of experiment; nor do we look for more cauſes than what are ſufficient to explain the phenomena; and when theſe are wanting, rather than reſolve effects into ſuperior agency, or unknown power, we had better acknowledge, at once, that we know nothing at all about them.

But mercurials and antimonials are known to be the moſt univerſal and powerful evacuants of any we are acquainted with. They are emetic, cathartic, diuretic, and ſudorific, to an eminent degree; but their different preparations are variouſly adapted for anſwering theſe purpoſes; ſome are better ſuited to promote one evacuation, and ſome another; but all of them greatly promote the ſecretions and excretions: then why need we have recourſe to a ſpecific power for their effect in the ſmall pox, when evacuation will ſufficiently account for it?

It would exceed the narrow limits of this little performance, to give a particular account of the peculiarities belonging to each preparation; nor is that neceſſary; it will be ſufficient to ſpecify thoſe which have been uſed with moſt ſucceſs in the preſent diſeaſe, and to explain the manner in which they operate.

From a knowledge of the nature of the diſeaſe, I think it pretty evidently appears, that medicines can be of little uſe in preparing for the ſmall pox, before the infection is received. Nor does there, indeed, ſeem to be much occaſion for ſubjecting the patient, long before this, to a ſtrict diet and regimen. The only uſe it can be of, is, to reduce the conſtitution to a ſtate of mediocrity; and to prevent it from running into thoſe extremes, which might otherwiſe be injurious; but, till the ferment is received, there is no aſſimilation to be moderated, or oppoſed, nor any virus to be thrown out of the conſtitution.

For the purpoſes, however, which I have juſt now mentioned, it may not be improper to ſubject the patient, for a few days, to ſuch a diet and regimen as has already been laid down. And in order that the ſtomach and bowels may be cleanſed of any ſordes that may be lodged in them, and put into a condition to digeſt and concoct the aliment properly, a doſe of the following medicine, N° 1. will be very ſerviceable.

N° 1. ℞ Pulv. jallap.
Crem. tart. aa ℈i.
Calomel. gr. iv. *miſce fiat*
Pulv. cathart. mane ſummed. cum regimine.

The calx of antimony has uſually been added to this *formula*; but that is an inelegance, from which, for reaſons already aſſigned, I think there does not accrue the ſmalleſt advantage.

After the patient has complied with this direction for one week *, let him take another doſe of this powder, in the morning, to prepare the way for what medicines are to come afterwards; and the ſame day inoculate.

There is a variety of ways in which this operation may be performed. If there is a patient under the ſmall pox ready at hand, a little freſh matter may be taken, by diping the point of a lancet into a puſtule; and then let there be a very ſlight inſition made, in that part of the arm, which is generally alotted for iſſues. It will be quite ſufficient to cut through the cuticle, and only juſt to reach the true ſkin, but it will not be amiſs if two or three little ſcratches of this ſort, are made about the ſame place, at the ſame time. The operator is then to ſtretch open the inſitions between his finger and thumb, and to moiſten them with the matter, by gently touching with the flat ſide of the infected lancet.

---

* Which, by the bye, in my own practice I have never found neceſſary; having always inoculated him, the ſame day in which I began to ſubject him to a courſe of diet and medicines.

Another way is, gently to introduce, obliquely, between the cutis and cuticle, a lancet moiſtened with the variolous matter, in the ſame manner as above; and the finger of the operator is to be applied to the point, in order to wipe off the infection from the lancet, when it is withdrawn: in which ever of theſe ways the operation is performed, it is of little importance whether any plaiſter or bandage is applied.

But there is a third, which upon the whole, I prefer as being more certain; and oftentimes it is not practicable to inoculate with freſh matter. When that is the caſe, I take a bit of thread which has been drawn through ſome ripe puſtules, or a ſmall piece of cotton that has been well ſaturated with the pus, and making a very ſlight inſition in the arm, as aforeſaid, apply it to the part. This is kept on by a doſſil of lint, covered over with a ſticking plaiſter, and is ſuffered to remain for a day or two. I am much of opinion, that it makes very little difference whether the infection is given in a large or ſmall quantity, ſince the ſucceſs ſeems chiefly to depend upon the ſtate of the conſtitution of the patient, as altered by medicines, diet and regimen. But though we ſee no bad effects follow from the uſe of a large quantity *, yet we find that the ſmalleſt

---

* It would ſeem as if the bramims were no ways ſparing in this reſpect, though their practice of keeping the infection, till it is a year old, before they make uſe of it, may poſſible weaken its force. Be that as it may, their ſucceſs appears to have been very remarkable.

Vid. Holwell, p. 16. 20.

imaginable is ſufficient to communicate the diſeaſe. One would always chuſe to take it from a healthful patient, who had a very good ſort, and that before the pock had come to its full maturity, becauſe then it ſeems poſſeſſed of a leſs degree of acrimony. Some have gone ſo far, as to take the infection from the fluid which oozes out of the wound of a patient inoculated, before he is ſeized with the fever; but that ſeems to me nothing more than a mere piece of refinement; and it is much to be doubted whether that or the other is moſt acrimonious; for we ſometimes find the wounds even of thoſe who have but very few ſmall pox afterwards, except juſt in thoſe parts, exceeding foul, and very ill conditioned.

In the evening after inoculation, give a bolus of five grains of calomel. Then,

N° 2. ℞ Calc. antimon. illot. ℥iſs.
Calomel. —— ʒj. *miſce fiat*
Pulv. gr. xij. pro doſ.

Of this powder the patient is to take three doſes; one, morning, noon, and night, the day following inoculation.

To one who prepares this powder, there will, at firſt ſight, appear a chymical inellegance in the preſcription; for as ſoon as you rub the calomel with the unwaſhed calx of antimony, the powder turns firſt of a browniſh, and afterwards of a blackiſh colour; but this does not happen if you make uſe of the waſhed calx, or the nitrum ſtibiatum, or both of them conjointly, after they have been ſeparated from each other.

This ſhews, that there is a condſierable difference between uſing the unwaſhed, and waſhed calx of antimony, even though you add nitrum ſtibiatum, or ſal polychreſt. which is pretty nearly the ſame thing, to the latter; and I have been at ſome pains to diſcover, to what this difference was owing.

At firſt, I ſuſpected that it was occaſioned by a ſmall portion of ſulphur ſtill adhering to the the calx, which was not perfectly diſſipated by the deflagrtaion. This, I imagined, converted the mercury to a blackiſh colour; but on triturating calomel with ſulphur, no ſuch effect followed. I then tried it with all the other materials one after another, and likewiſe with them mixed together, but no ſuch effect was produced by it; but on adding to them a ſmall quantity of ſalt of tartar, the colour was ſtruck immediately. This change, therefore, is produced by the vegetable fixed alkali, contained in the nitre, which is uſed in the deflagration; which, not being perfectly ſaturated by the acid in the ſulphur, and conſequently not all converted into a nitrum vitriolatum, ſtill remains in its ſtate of alkali; and this alkali uniting with the acid contained in the calomel, gives us the brown precipitation of mercury, which is the effect here produced. By uſing the unwaſhed calx of antimony, therefore, two advantages ſeem to be gained; we firſt, by that means obtain a milder preparation of mercury, which may be uſed in a larger quantity; and ſecondly, the alkali, which is ſtill not compleatly ſaturated, acts as a conſiderable diaphoretic. But however this may be, whenever I make uſe of the waſhed inſtead of the unwaſhed calx of antimony, I always add a ſmall quantity of tartar emetic, to ſupply its deficiency in this reſpect *.

The propriety of this practic eis likewiſe confirmed by the experience of Dr. Dimſdale, whoſe medicines, (I mean his powders, p. 18. 31.) are compounded very much upon this principle.

I cannot however help taking notice of a chymical error he is guilty of, in this preſcription, in ordering tartar emet. to be added to the pulvis e chelis; for as all acids have a ſtronger affinity to the teſtacea than to antimony, I am afraid the uniting theſe two together will effect a decompoſition very much to the detriment of the medicine. This circumſtance I ſee is likewiſe taken notice of by Dr. Fothergil in the third vol. of the London obſervations, and is the more to be attended to, becauſe by joining it with the calx of antimony, which will anſwer the end every bit as well, no ſuch effect need be apprehended.

On

---

* This medicine I thought of conſiderable uſe in the caſe of the reverend Mr. OCCUM the Indian preacher, whom I alone prepared and attended during the whole courſe, under inoculation for the ſmall pox, ſoon after his arrival in England. This fact I mention, not that I claim any merit in it myſelf, but becauſe the credit of it has been vainly aſſumed, without any grounds, and by that means ſeveral individuals have been groſsly impoſed upon by a *reverend doctor of divinity*.

On the third day, including the one on which the patient was inoculated, give a doſe of the following pills:

N° 3. ℞ Panac. antimon, ʒſs.
Calomel. ʒj.
Bol. armen. ʒij
Mucilag. gum. tragacanth. q. ſ.
ut fiant pil. 45.

A grown perſon is to take three of theſe pills early in the morning. Their ultimate effect is both to vomit and purge; but then they previouſly make the patient exceedingly ſick, which is the thing principally intended; and for that reaſon we order the patient to keep quiet in bed till he is diſturbed by them; for if he was ſuffered to ſtir about, they would immediately begin to exert their emetic and cathartic qualities: that we may, however, more effectually ſecure to them that effect, they are made up with gum tragacanth, in order that they may diſſolve ſlowly in the ſtomach; and the benefits ariſing from this nauſea and ſickneſs, are, not only that they occaſion a great flow of humours into the ſtomach and inteſtines, to be evacuated by the ſubſequent operations of vomiting and purging; but ſo great is the ſympathy ſubſiſting between the ſtomach and other organs of the body, that by them all the ſecretions and excretions, eſpecially thoſe of urine and perſpiration, are greatly promoted.

It makes very little odds, in my opinion whether we uſe the penacæa or the ſulph. aurat. antimon. in this preſcription, for they are nearly the ſame in their effects, only that gr. ji. of the former is a full doſe for a grown perſon, which ſhews it operation to be more violent. Nor do I expect much from the exhibition of mercury along with it, *as mercury*, any farther than as it may tend more effectually to deterge and cleanſe the primæ viæ. The Bol. Armeniac is added, with no other view, than to render the pills of a better ſize.

Theſe are all the medicines that are neceſſary to be employed in preparing for the ſmall pox, as I am fully convinced from manifold experience: however they are often to be repeated, alternately, and at proper intervals; but it is next to impoſſible, to lay down any certain rules with regard to the frequency and quantity in which they are to be uſed; for the judgment of every one, who is the leaſt acquainted with the animal œconomy, and with the great variety which takes place in different conſtitutions, muſt tell him, that this muſt *vary* according to the peculiar circumſtances of every different ſubject: and a man muſt be in the habit of preparing people for the ſmall pox, for ſome time before he will be able to adjuſt theſe matters properly.

Neither would it turn out to account for me to enter at preſent into a full diſcuſſion of the point, how mercury acts upon the body; that is, whether it acts by its gravity, by a ſpecific quality, or by its ſtimulus, though I confeſs myſelf inclined to be of this laſt opinion; but in whatever manner it acts, to give it in ſo large a quantity as to ſalivate, is never neceſſary.

It

It will be ſufficient for patients to take three papers in a day, of the powder, N° 2. in doſes from gr. ij. for a child of a year old, to xij. gr. for a grown perſon, except on thoſe days when pils or a purge are given, and then two in a day will be all that are requiſite; and by thus repeating it in ſmall quantities, a great advantage ſeems to be gained; for by that means, mercury may be taken in a much greater quantity, without ſalivating; while it more effectually promotes the other ſecretions.

The pills may be taken to the number of three by adults, lowering the quantity till it comes to half a one, for a child of two years old, which is the youngeſt to whom we may venture to adminiſter them. But inſtead thereof, it will be proper that they ſhould take a doſe of N° 1. the cathartic powder. Theſe pills are to be repeated about the ſixth day; after which, it is expected that the gums ſhould be a little touched, juſt ſo much and not a jot more than is ſufficient to ſhew that the mercury has found its way into the habit;

bit; and in caſe this ſhould not happen, it will be proper to give a bolus, from a grain to four grains of calomel, every evening; and the powders, N° 2. are to be continued till the coming on of the fever. But if, on the other hand, the gums are much affected, and there is a conſiderable flow of ſaliva into the mouth, give a doſe from eight to forty grains of the cathartic powder, N° 1. and if this ſhould not be ſufficient to check it, a drachm or two of flores ſulphuris will do that effectually.

As children and perſons who are of a delicate conſtitution, have the ſmall pox, for the moſt part much milder in the natural way, than athletic and grown perſons, ſo they likewiſe ſtand in need of proportionably leſs preparation. Children, under a year old, need do nothing more than take one or two gentle doſes of the purge, N° 1. at proper intervals, with the powder, N° 2. every day, as directed; the laſt of which has little or no ſenſible operation. But adults, of a ſtrong and robuſt habit, while they are plied very cloſely with this powder, muſt be worked off with the pills and purges, pretty thoroughly.

I am in no haſte, when the fever comes on, in putting my patients to bed; on the other hand, I ſuffer them to walk about the houſe, and in fair weather in the open air; the rooms are likewiſe kept cool and aired as uſual; nor do I ſuffer them to wear more cloaths, or to be covered with more when in bed than they uſed to have formerly. The firſt of my confining them to bed, is about the time when the eruption is expected; and then I give them ſmall doſes of tartar emetic, and order them to drink plentifully of wine whey to promote a ſweat; which ſeems to have this good effect, of not only carrying off the variolous matter, and of lowering the fever, but likewiſe of filling thoſe puſtules which are diſpoſed to come to ſuppuration *. To conclude,

What

---

* I have experienced the good effects of tartar emetic in the natural ſmall pox alſo, as will appear from the following inſtance.

A

What I have here advanced, as it had been the ſubject of my own obſervation, I

A boy, aged ſix years, was ſeized on Saturday, the fourth of January, with a fever, which was attended with coſtiveneſs, and he vomited up every thing that was taken into his ſtomach. On Monday, the ſixth, his fever, coſtiveneſs, and inclination to vomit, ſtill continued, when I was ſent for. As his ſtomach ſeemed to have been ſufficiently emptied, by the efforts he had made, I immediately ordered him a doſe of gently opening phyſic, which had the deſired effect of procuring him a ſtool or two; and that evening, ſmall eruptions began to appear here and there on his face and hands, but all the night he remained hot and reſtleſs. Next day, the eruptions appeared pretty plentifully all over his body; they were rather pale than red, and the fever, heat, and reſtleſſneſs ſtill continued. He was then ordered a ſaline julep, and an anodine draught to take at bed time, which moderated his fever a little for the preſent, and procured him ſome ſleep; but next day his ſkin was dry, and his heat, thirſt, and reſtleſſneſs, were as great as ever. Pulſe 150. The puſtules, though they had all made their appearance, yet they did not fill, but appeared pale and flat, and ſome of them were dented, with a purple ſpot in the middle. I then ordered tart. emit. gr. $\frac{1}{3}$ to be taken every three hours along with the julep. The firſt doſe made him a little ſick at ſtomach, and then immediately threw him into a gentle ſweat, which communicated itſelf equally all over his body, and it was kept up through the day by the ſucceeding doſes. At bed time he took gr. j. with Gtt. xij of L. L. which procured a very plentiful ſweat through the night; he reſted eaſy, the

I thought it my duty to communicate to the public. To them the conſtant endeavours and moſt vigorous exertion, of each individual to promote their welfare is continually owing. And certainly in doing this there is nothing I can have ſo much at heart as to promote the welfare of my fellow creatures. The giving the ſmalleſt hint towards the mitigation of ſo deſtructive a diſeaſe; a diſeaſe, which, to ſay no more of it, is ſo peculiarly injurious to the moſt beautiful part of our ſpecies, muſt, I flatter myſelf be conſidered, as doing an acceptable ſervice; but the validity of the practice I have been juſt now recommending, is confirmed, not only by my experience, but by the authority of thouſands, who have themſelves experienced the good effects of it.

---

the pocks began to fill, and his fever, next day, was conſiderably abated. The tartar emit. and julep were, however, repeated, by which a conſtant moiſture was preſerved on the ſkin; the fever continually grew leſs and leſs, and the maturation of the puſtules went on as well as could be expected; and by continuing them for four or five days, the ſymptoms always grew milder and milder; the pock at laſt dried away, and the patient perfectly recovered.

I cannot, however, conclude, without finding fault with thoſe who are for laying the whole ſtreſs on only ſome of the particular circumſtances I have mentioned, for they are all to be ſtrictly attended to. The cool regimen is undoubtedly ſerviceable, and ſo is it of uſe to pay ſome reſpect to the manner in which we communicate the infection; but if I were to give the preference to one thing above another, it certainly would be to the diet and medicines; for I have inoculated the moſt athletic perſons, who had been expoſed to the ſun, had uſed much exerciſe, were juſt come from ſea, and had lived upon ſalt proviſions, without any previous preparation, and without ſubjecting them to any remarkably cool regimen; and yet, by confining them cloſely to a proper diet, and plying them conſtantly with theſe medicines, they have nevertheleſs had the diſeaſe very mildly.

POSTCRIPT.

The following caſes it may not be amiſs to communicate to the public, as I think they may be of uſe, by preventing practitioners from being too dogmatical and raſh in pronouncing their patients to be over the ſmall pox, who have only very ſlight appearances: and I would likewiſe caution them not to lay too much ſtreſs on the cool regimen, for though ſuch an admonition might not perhaps have been neceſſary in theſe particular caſes, yet I cannot help being confidently of opinion, that all thoſe irregular and repeated eruptions, ſo frequently complained of by the patients of a very famous inoculator, have proceeded from his puſhing that part of the preparation to too great a length; perhaps too to the ſame head we may refer, the chief of thoſe anomalous caſes mentioned by Dr. Dimſdale *.

---

* Vid. his Treatiſe on Inoculation, p. 52, 53.

But the principle reaſon of my publiſhing theſe caſes is, becauſe it has been currently reported that theſe were inſtances of patients having the ſmall pox twice; and certainly they are the beſt atteſted of any I have yet met with; but from hence I conclude that if all that have been reported to be ſuch, were as minutely enquired into, none of them would be found by any means concluſive. The firſt appearances here, we ſhall ſee were very inconſiderable, ſuch as could by no means be clearly denominated ſmall pox; and the ſecond, happened within a time when many are known to be ſeized with the fever, who have it only once by inoculation. If therefore it be allowed that the little boys firſt appearance was not ſmall pox, which I think will be no difficult matter, as neither his arm inflamed, nor did he complain of any manner of ſickneſs or fever previous to it, it will be very near as eaſy to admit that the firſt appearances with the young lady were not ſmall pox, neither, as none of them came to ſuppuration; and then, we may readily ſuppoſe the whole affair to have proceeded in the following manner, viz. that the little boy ſickned on the nineteenth day, which is no uncommon caſe, from the inoculation; and that the young lady either miſſed the infection from the inſition, but catched it from her brother, and not from the perſon ſhe went to viſit, in conſequence of which ſhe ſickned ſix days afterwards; or elſe from *an imperfect eruption* the body was not ſufficiciently ſecured from having a ſecond infection. This I think is a very probable account of the matter: but that the reader may judge for himſelf, I ſhall ſubjoin the caſes, nearly as they were tranſmitted to me by Mr. Bradney, a very ſenſible apothecary in town, by whom the patients were inoculated. I ſhall only beg leave to premiſe, that even if the fact alledged was granted, yet two inſtances only in perhaps 50,000, could be no objection to inoculation; eſpecially as we have reports, which I believe demand fully as much credit, of perſons having the ſmall pox twice in the natural way, though I confeſs I think there are no ſufficient grounds to pay much credit to either the one or the other.

SIR,

On the 7th of May laſt, I inoculated with fluid matter, taken on the 9th day of the diſeaſe, a young lady of nine years, her brother of ſeven years and a half, and the coachman, a ſtrong healthy man of forty years of age; all after a preparation of a fortnight's well regulated diet, without meat or butter, and after giving them three mercurial purges. On the 9th, the young lady and coachman ſhewed evident ſigns of infection by the edges of the orifice being ſlightly inflamed, which gradually increaſed till it became of a conſiderable ſize; and on the ſixth day after inoculation, a ſmall diſcharge of well digeſted pus began, from the orifices, which I ſhould have uſed for inoculation if an opportunity had offered; this continued for a fortnight, after which they gradually healed with a dry ſcab. On the ſeventh day two puſtules appeared in the forehead of the coachman, which, came to maturity and laſted ſeven or eight days; being preceded by a giddineſs in the head, which according to his diſcription, affected him like drunkenneſs, and a ſlight fever, ſince which nothing has ailed him, and he remains perfectly well.

On the ſame day with the coachman four puſtules appeared within an inch of the orifice in the young lady's arm, preceded by the ſame complaints of giddineſs and ſlight fever the day before the eruption, which proved ſlight, and did not laſt long enough for maturation. Theſe however I pronounced ſmall pox, and the whole affair to be over, from ſeveral caſes ſimilar to this mentioned by Dr. Dimſdale in his late treatiſe on that diſorder, which he calls the ſhort way of having it.

The little boy's arms did not inflame, and I was very donbtful with regard to the ſucceſs of the operation in him, as he had no complaints except a little feſtering of one orifice without inflammation, which came on about the ſeventh or eighth day; but this was ſucceeded on the tenth by one compleat large puſtule on the cheek, which continued full ſeven days, and on the eighth it ſcabbed over and the upper cruſt fell off, leaving a conſiderable appearance of the puſtule ſtlll remaining above the ſkin. This I looked on as a true ſmali pox and pronounced him ſafe, not knowing any other eruption that will laſt the ſame length of time; but to my ſurpriſe, three days afterwards, being the nineteenth from inoculation, the ſame arm ſhewed ſigns of inflammation: he complained of ſoreneſs in the part, and on ſeeing it I prognoſticated a freſh eruption, which accordingly took place three days after, being preceded by heavineſs and drowſineſs, ſickneſs at ſtomach, and very ſlight fever. He had about forty puſtules, which maturated early, and he remains perfectly well.

His parents imagined he caught a ſecond infection from his ſiſter with whom he lay; but as the firſt ſign ſhewed itſelf in the orifice, I could not agree with them; and the iſſue I think plainly ſhews the contrary; for about three weeks after, viz. on the 1ſt of June, the young lady went to viſit a neighbour's child, who had gone through the diſtemper ſomewhat more ſeverely, ſo that the face was diſagreeable in appearance from the brown ſcabs remaining hard upon it. At ſight of this object ſhe appeared frightned, turned pale and ſhuddered, and after ſtaying about an hour, returned home, complaining of chileneſs; at night ſhe grew hot, next day the fever increaſed, and run high the night following: in the morning viz. June 3d an eruption appeared in the face, which I ſaw to be ſmall pox, and it ſpread itſelf gradually all over the body, till the puſtules amounted to three or four hundred; the fever in the mean time proportionably abating as the eruption advanced, and on the 6th of June it entirely ſubſided; on the 10th the puſtules ſcabbed over and ſhe was well enough to walk in the garden. This caſe was ſeen by two other phyſicians as well as yourſelf, who all pronounced it to be true ſmall pox.

If, Sir, you think proper to publiſh the above caſes with my name annexed, you are extreamly welcome. I am

---

SIR,

Your obedient

humble ſervant.

Great Eaſtcheap,
Nov. 3. 1767.

JOHN BRADNEY.

AN

APPENDIX.

AFTER the foregoing ſheets of the firſt edition were committed to the preſs, a very ingenious gentleman, who is well acquainted with Mr. SUTTON, and has been much converſant among his patients, brought me a quantity of the medicines which he uſes in inoculating for the ſmall pox, and which were prepared by himſelf. They conſiſt of a powder, a pill, and ſome drops; and in order that I might determine their nature and compoſition, I ſubjected them to the following experiments.

Of the POWDER.

Experiment I.

To a ſmall quantity of Mr. Sutton's powder, which was of a greyiſh colour, a few drops of volatile alkali were added, which immediately changed it to a deep black colour.

Experiment II.

To a ſmall quantity of the ſame, a few drops of a ſolution of ſalt of tartar were added; the colour was likewiſe changed to a deep black.

Experiment III.

To a ſmall quantity of the ſame, a few drops of lime water were added; the colour approached to that occaſioned by the former additions; but the degree of black was leſs than in experiment I. and II.

EXPERIMENT IV.

Calomel, treated in the ſame manner, with the ſame additions, exhibited the ſame phenomena.

EXPERIMENT V.

The colour of Mr. Sutton's powder was exactly imitated, by adding a few grains of æthiops mineral to calomel, and the whole, upon the addition of vol. alkali, ſalt of tartar, and lime water, gave the ſame degree of black as in experiment I. II. III.

EXPERIMENT VI.

Neither æthiops mineral, when treated by itſelf, nor when united with a calcarious earth (crabs eyes) ſo as to give the whole a colour not unlike Mr. Sutton's powder, exhibited any ſuch appearances on the addition of either vol. alkali, ſal. tart. or quick lime.

The doſe of Mr. Sutton's powder was about xvj grs. and from its bulk, it appeared very ponderous. Grs. vj. of æthiops is ſufficient to communicate the colour to grs. x. of calomel: ſo that we may ſuſpect that quantity of it to be in the doſe.

COROLLARY.

From the above experiments, it evidently appears, that the baſis of his powder is calomel; which, though in the doſe of gr. x. may have its effects weakened by the addition of æthiops, which he uſes to colour it, it being a well-eſtabliſhed principle, that ſulphur always weakens the effect of mercury. Beſides, it has been obſerved, that Mr. Sutton's powder has in ſeveral caſes brought on ſalivation, which confirms the above.

Of

Of the PILL.

EXPERIMENT VII.

The pilulæ cochiæ are, both in taſte and ſmell, ſo much the ſame with Mr. Sutton's pill, that the moſt accurate in theſe ſenſes could not diſtinguiſh them from one another; the bitter of the colocynth and aloes being ſtrongly marked; while the aroma of the cloves is no leſs obvious.

EXPERIMENT VIII.

Upon the ſurface of Mr. Sutton's pill, which was of a light grey colour, a few drops of a volatile alkali were poured, and it ſtruck immediately a deep black. The ſame appearances occurred on the addition of ſalt of tartar and lime water.

EXPERIMENT IX.

Upon the addition of volatile alkali to the pilulæ cochiæ, no change of colour followed; they are naturally of a blackiſh appearance; however, when a few grains of calomel were added, they became of the ſame light grey colour with Mr. Sutton's; and upon the addition of vol. alkali, were changed into a deep black.

From theſe three laſt experiments, it appears, that Mr. Sutton's pill conſiſts of the above-mentioned purgatives mixed with calomel: and its effects prove the ſame.

Of the ACID DROPS.

EXPERIMENT X.

This acid, with which he prepares his punch, is obviouſly of the ſame nature with the dulcified volatile vitriolic acid that ariſes during the diſtillation of æther, and is the ſame with what exiſts in large quantity in the liquor Anodinus of Dr. Hoffman. There may perhaps be ſome of the dulcified marine acid joined along with it, as in Clutton's febrifuge tincture, but it was unneceſſary to ſubmit it to any chymical experiment.

It does not appear, from any experiments hitherto made, that the ſmalleſt quantity of antimony enters into the compoſition of Mr. Sutton's medicines. Their excellency ſeems wholly to conſiſt in the mercurial joined with the purgative. He likewiſe makes uſe of Glauber's ſalts ; but for the method of giving theſe as well as his other medicines, Mr. Chandler of Canterbury may, with propriety, be conſulted.

BRITISH MUSEUM

FINIS.

ERRATA.

Page 9. l. 8. for *cream*, r. *crem*. p. 15. l. 13. for *cream*, r. *crem*. p. 15. l. 18. for *flos*, r. *flores*. p. 31. l. 21. for *ſeemingly*, r. *ſeeming*. p. 32. l. 13. for *accordingly*, r. *according*. p. 37. l. 3. for *quanty*, r. *quantity*. p. 38. l. 26. for *vitals*, r. *vials*. p. 56. l. 17. for *healing*, r. *beating*. p. 66. l. 22. for *bramims*, r. *bramins*.